

1 I claim:

1. A connection, comprising:

a. an elongated tension member, having first and second ends, said elongated tension member being anchored at said second end;

b. a fastening member attached to said elongated tension member at said first end;

c. a resisting member that receives said elongated tension member and is disposed between said fastening member and said second end of said tension member;

d. an expansion device that receives said elongated tension member there through and is compressively loaded between said fastening member and said resisting member by operation of said fastening member on said elongated tension member, said expansion device comprising,

1. a surrounding sleeve, having two ends, and a central aperture through which said elongated tension member is inserted, wherein a portion of said central aperture is formed as a substantially cylindrical inner surface and wherein at least a portion of said cylindrical inner surface is formed with a thread;

2. first and second bearing members received in said central aperture of said surrounding sleeve and operatively connected to said surrounding sleeve, said first and second bearing members also having apertures through which said elongated tension member is inserted, and wherein at least one of said bearing members has a cylindrical outer surface formed with a thread that mates with said thread of said cylindrical inner surface of said surrounding sleeve and is connected to said surrounding sleeve only by the mating attachment of said thread on said cylindrical outer surface with said thread of said surrounding sleeve, such that said at least one bearing member can rotate in relation to said surrounding sleeve, and said first and second bearing members are formed with outer axial ends that protrude out of said surrounding sleeve, said outer axial end of said first bearing member contacting said fastening member, and said outer axial end of said second bearing member contacting said resisting member; and

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3. a torsion spring connecting said first and second bearing members, said torsion spring biasing said first and second members in opposite rotational directions such that said at least one of said bearing members is forced to rotate along said thread of said surrounding sleeve away from said other bearing member and out of said surrounding sleeve, said torsion spring being disposed within said surrounding sleeve.

2. The connection of claim 1, wherein:

10 both of said bearing members have cylindrical outer surfaces formed
with threads that mate with said thread of said cylindrical inner
surface of said surrounding sleeve, and both of said bearing members
are connected to said surrounding sleeve only by the mating
attachment of said threads on said cylindrical outer surfaces with said
15 thread of said surrounding sleeve, such that both of said bearing
members can rotate in relation to said surrounding sleeve.

3. The connection of claim 1, wherein:

20 a. said elongated tension member is at least partially formed with a thread where said fastening member attaches to said elongated tension member;

b. said fastening member attaches to said elongated tension member by means of an internal thread that mates with said thread of said elongated tension member; and

25 c. said thread of said surrounding sleeve is threaded in the opposite direction as said thread of said elongated tension member.

4. The connection of claim 1, wherein said expansion device further comprises:

30 an inner sizing sleeve that is received by said surrounding sleeve and is disposed between said torsion spring and said elongated tension member.

5. The connection of claim 1, wherein said expansion device further
35 comprises:

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1 a locking clip that is releasably attached to said expansion device, said
locking clip holding said first and second bearing members so as to
prevent them from rotating under said influence of said torsion spring
and causing said device to expand.

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6. The connection of claim 1, wherein said expansion device further comprises:

a pair of annular seals disposed at said ends of said surrounding sleeve to protect said thread of said surrounding sleeve.

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7. The connection of claim 1, wherein:

said thread of said surrounding sleeve near at least one of said ends of said surrounding sleeve is disturbed so that it is not possible for a bearing member traveling on said thread to pass all the way out of said surrounding sleeve.

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8. The connection of claim 1, wherein:

a. said torsion spring is formed with first and second ends; and

b. said first and second bearing members are formed with annular recesses that can receive said ends of said torsion spring so that expansion device can be made more compact.

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9. The connection of claim 1, wherein:

a. said elongated tension member has first and second ends and said fastening member, resisting member and expansion member are disposed near said first end; and

b. said second end of said elongated tension member is connected to a structural member in a building.

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30 10. The connection of claim 9, wherein:

said building has a structural frame at least a portion of which is made from wood.

11. The connection of claim 2, wherein:

35 said thread of said surrounding sleeve near at least one of said ends of
said surrounding sleeve is disturbed so that it is not possible for a

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12. The connection of claim 11, wherein:

10 13. The connection of claim 12, wherein:

20 14. The connection of claim 13, wherein said expansion device further
comprises:

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15. The connection of claim 16, wherein said expansion device further comprises:

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16. The connection of claim 15, wherein said expansion device further comprises:

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Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

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17. The connection of claim 2, wherein:

said torsion spring connects to said first and second bearing members near said outer axial ends of said bearing members.

18. The connection of claim 1, wherein:

said thread of said surrounding sleeve near at least one of said ends of said surrounding sleeve is disturbed so that it is not possible for a bearing member traveling on said thread to pass all the way out of said surrounding sleeve.

19. The connection of claim 18, wherein:

said torsion spring connects to said first and second bearing members near said outer axial ends of said bearing members.

20. The connection of claim 19, wherein said expansion device further comprises:

an inner sizing sleeve that is received by said surrounding sleeve and is disposed between said torsion spring and said elongated tension member.

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